

CoolMOS Power MOSFET ISOPLUS220™

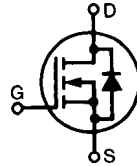
Electrically Isolated Back Surface

N-Channel Enhancement Mode

Low $R_{DS(on)}$, High Voltage MOSFET

IXKC 13N80C

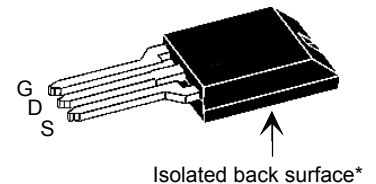
$$\begin{aligned} V_{DSS} &= 800 \text{ V} \\ I_{D25} &= 13 \text{ A} \\ R_{DS(on)} &= 290 \text{ m}\Omega \end{aligned}$$



COOLMOS
Power Semiconductors

Symbol	Test Conditions	Maximum Ratings	
V_{DSS}	$T_J = 25^\circ\text{C to } 150^\circ\text{C}$	800	V
V_{GS}	Continuous	± 20	V
I_{D25}	$T_C = 25^\circ\text{C}$; Note 1	13	A
I_{D90}	$T_C = 90^\circ\text{C}$; Note 1	9	A
$I_{D(RMS)}$	Package lead current limit	45	A
E_{AS}	$I_D = 4\text{A}$, $T_C = 25^\circ\text{C}$	670	mJ
E_{AR}	$I_D = 10\text{A}$	0.5	mJ
dv/dt	$V_{DS} < V_{DSS}$, $I_F \leq 17\text{A}$, $T_{VJ} = 150^\circ\text{C}$ $d_s/dt = 100\text{ A}/\mu\text{s}$	6	V/ns
P_D	$T_C = 25^\circ\text{C}$	125	W
T_J		$-55 \dots +150$	$^\circ\text{C}$
T_{JM}		150	$^\circ\text{C}$
T_{stg}		$-55 \dots +125$	$^\circ\text{C}$
T_L	1.6 mm (0.062 in.) from case for 10 s	300	$^\circ\text{C}$
V_{ISOL}	RMS leads-to-tab, 50/60 Hz, $t = 1\text{ minute}$	2500	V~
F_c	Mounting force	11 ... 65 / 2.4 ... 11	N/lb
Weight		2	g

ISOPLUS 220™



G = Gate, D = Drain,
S = Source

* Patent pending

Features

- Silicon chip on Direct-Copper-Bond substrate
 - High power dissipation
 - Isolated mounting surface
 - 2500V electrical isolation
- 3RD generation CoolMOS power MOSFET
 - High blocking capability
 - Low on resistance
 - Avalanche rated for unclamped inductive switching (UIS)
- Low thermal resistance due to reduced chip thickness
- Low drain to tab capacitance(<30pF)

Applications

- Switched Mode Power Supplies (SMPS)
- Uninterruptible Power Supplies (UPS)
- Power Factor Correction (PFC)
- Welding
- Inductive Heating

Advantages

- Easy assembly: no screws or isolation foils required
- Space savings
- High power density

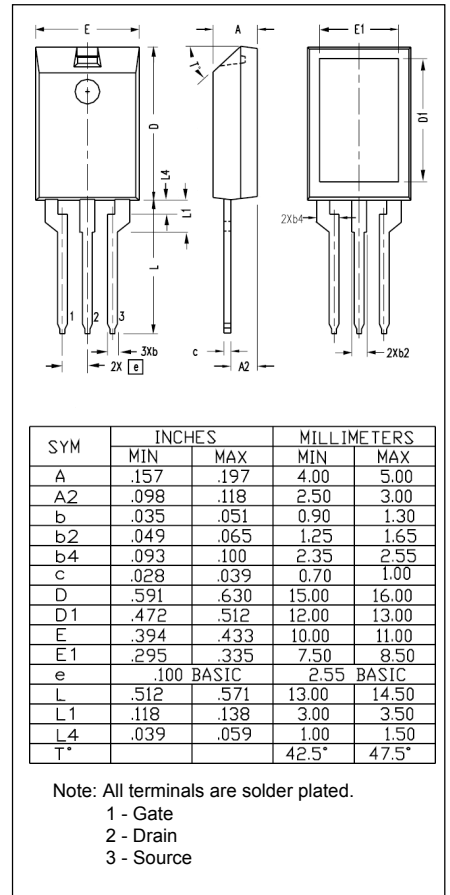
Symbol	Test Conditions	Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified)		
		min.	typ.	max.
$R_{DS(on)}$	$V_{GS} = 10\text{V}$, $I_D = I_{D90}$, Note 3 $V_{GS} = 10\text{V}$, $I_D = I_{D90}$, Note 3 $T_J = 125^\circ\text{C}$		250 550	290 mΩ mΩ
$V_{GS(th)}$	$V_{DS} = V_{GS}$, $I_D = 1\text{mA}$	2		4 V
I_{DSS}	$V_{DS} = V_{DSS}$ $V_{GS} = 0\text{V}$		$T_J = 25^\circ\text{C}$ $T_J = 125^\circ\text{C}$	25 μA μA
I_{GSS}	$V_{GS} = \pm 20\text{V}_{DC}$, $V_{DS} = 0$			$\pm 100\text{ nA}$

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Symbol	Test Conditions	Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified)		
		min.	typ.	max.
$Q_{g(\text{on})}$	$V_{GS} = 10\text{ V}, V_{DS} = 640\text{ V}, I_D = 17\text{ A}$		83	nC
Q_{gs}			9	nC
Q_{gd}			42	nC
$t_{d(\text{on})}$	$V_{GS} = 10\text{ V}, V_{DS} = 640\text{ V}$ $I_D = 17\text{ A}, R_G = 4.7\ \Omega$		25	ns
t_r			15	ns
$t_{d(\text{off})}$			75	ns
t_f			10	ns
R_{thJC}				1.0 K/W
R_{thCH}		0.30		K/W

Reverse Conduction		Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified)		
Symbol	Test Conditions	min.	typ.	max.
V_{SD}	$I_F = 6.5\text{ A}, V_{GS} = 0\text{ V}$ Note 3		1	1.2 V

Note: 1. MOSFET chip capability
2. Intrinsic diode capability
3. Pulse test, $t \leq 300\ \mu\text{s}$, duty cycle $d \leq 2\%$

ISOPLUS220 OUTLINE


IXYS reserves the right to change limits, test conditions, and dimensions.

IXYS MOSFETS and IGBTs are covered by one or more of the following U.S. patents: 4,835,592 4,881,106 5,017,508 5,049,961 5,187,117 5,486,715
4,850,072 4,931,844 5,034,796 5,063,307 5,237,481 5,381,025